

## CONNECTOR FOR COAXIAL CABLE

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates to connectors and more particularly to a  
5 connector connectable to a coaxial cable coupled to a cable TV or computer  
monitor, the coupled connector and the cable being adapted to prevent moisture  
from entering into the coupled portion and thus preventing conductive members  
inside the coupled portion from being rusted.

#### 2. Description of Related Art

10 Connectors for coaxial cable are well known. A conventional F class  
connector of an electrical device (e.g., TV, radio, or the like) is threadedly  
coupled to a coaxial cable so that the electrical device is able to receive signals  
via the cable.

A conventional F class connector 10 for coaxial cable is shown in FIGS. 1A  
15 and 1B. The connector 10 comprises a body 11 including a rear, cylindrical shell  
12, an internal sleeve 13 surrounded by the shell 12, and a forward nut 14  
having internal threads coupled to a front end of the sleeve 13 (see FIG. 1A). As  
shown in FIG. 1B, the connector 10 is coupled to one end of a coaxial cable 16  
comprising a central conductor and an internal insulator (not shown) surrounded  
20 the central conductor. Both the central conductor and the internal insulator are  
inserted into the sleeve 13. The cable further comprises a braided outer  
conductor (not shown) surrounded the internal insulator and a shield. Both the  
outer conductor and the shield are fitted in the space between the shell 12 and  
the sleeve 13. Furthermore, the nut 14 is threadedly secured to a mated  
25 connector of an electrical device (not shown). Finally, a tool (e.g., pliers) is used  
to press the shell 12 against the shield of the cable 16 for fastening the  
connector 10 and the cable 16 together.

However, the prior art suffered from a disadvantage. For example, a plurality of (e.g., six) gaps 17 are formed between the shield and the shell 12. As such, moisture may enter into the connector through the gaps 17. Eventually, rust may form inside the connector (i.e., at the braided outer conductor and the  
5 central conductor). As understood that rust may degrade the signal transmission quality.

Thus, it is desirable to provide a novel connector for coaxial cable in which the coupled connector and the cable are adapted to prevent moisture from entering into the coupled portion and thus prevent conductive members inside  
10 the coupled portion from being rusted.

#### SUMMARY OF THE INVENTION

It is an object of the present invention to provide a connector connectable to a coaxial cable including a central conductor, an outer insulator surrounded the central conductor, a braided outer conductor in the form of a cylindrical shell  
15 surrounded the outer insulator, and a shield surrounded the outer conductor, the connector comprising a body including an outer sleeve, an inner sleeve having a front, outer extending rim, an annular space formed between the outer and the inner sleeves, and a forward rotatable nut having a rear inwardly extending rim rotatably disposed between the outer extending rim and the outer sleeve; a  
20 hollow, cylindrical coupling fitted on a rear section of the outer sleeve, the cylindrical coupling including a rear inwardly extending flange; and a flexible sealing ring surrounded by the cylindrical coupling, the sealing ring including flared front and rear ends and a narrow intermediate section wherein the front end thereof is spaced apart from a rear end of the outer sleeve prior to coupling  
25 the connector to the cable and the rear end thereof is urged against the flange, whereby inserting the front end of the cable into the cylindrical coupling will snugly fit the outer insulator in the inner sleeve to couple the central conductor

to a mated connector and dispose the outer conductor and the shield inside the outer sleeve; and pushing the cylindrical coupling forward will compress the sealing ring to urge against the front end of the sealing ring against the rear end of the outer sleeve and further recess the intermediate section to fasten on the shield. By utilizing the present invention, it is possible of preventing moisture from entering into the connector through the intermediate section and thus preventing the central and the outer conductors from being rusted by moisture.

In one aspect of the present invention the sealing ring is formed of either synthetic rubber or elastomeric material.

In another aspect of the present invention the flange comprises an annular slope inwardly extended, and an annular gap between the slope and an inner wall of the cylindrical coupling so as to fit the rear end of the sealing ring therein.

The above and other objects, features and advantages of the present invention will become apparent from the following detailed description taken with the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a cross-sectional view of a conventional connector for coaxial cable;

FIG. 1B is a perspective view of the connector coupled to one end of the cable;

FIGS. 2A and 2B are partial and full cross-sectional views of a connector according to the invention respectively;

FIG. 3 is a cross-sectional view of the hollow, cylindrical coupling;

FIG. 4 is a cross-sectional view of the sealing ring; and

FIGS. 5A and 5B are cross-sectional views for illustrating the connector and a coaxial cable prior to coupling and after being coupled respectively.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 5A, a coaxial cable 50 comprises a central conductor 51, an outer insulator 52 surrounded the central conductor 51, a braided outer conductor 53 in the form of a cylindrical shell surrounded the outer insulator 52, and a shield 54 surrounded the outer conductor 53. For connecting to a connector of the invention, one ends of the central conductor 51 and the outer insulator 52 are exposed. Also, one end of the outer conductor 53 is exposed and is covered on one end of the shield 54.

Referring to FIGS. 2A and 2B, a connector 20 of the invention is shown. The connector 20 comprises a body 21 including an outer sleeve 22, an inner sleeve 23 surrounded by the outer sleeve 22, the inner sleeve 23 having an outer extending rim 27 in the forward end, an annular space 24 formed between the outer and the inner sleeves 22 and 23, and a forward rotatable nut 25 having an inwardly extending rim 26 in the rear, the rim 26 being rotatably disposed between the outer extending rim 27 and the outer sleeve 22, a hollow, cylindrical coupling 30 fitted on a rear section 28 of the outer sleeve 22, and a flexible sealing ring 40 surrounded by the cylindrical coupling 30, the sealing ring 40 being spaced apart from a rear end 29 of the outer sleeve 22 prior to coupling the connector 20 to a cable as described later.

Referring to FIGS. 3, the cylindrical coupling 30 comprises a cylindrical portion 31, an inwardly extending rim 32 in the rear, a first bore 33 surrounded by the cylindrical portion 31, the first bore 33 being conformed to sleeve on the rear section 28 of the outer sleeve 22, an annular slope 34 on the rim 32, the slope 34 being inwardly extended toward the first bore 33, and a second bore 35 formed by the rim 32, the second bore 35 being smaller than the first bore 33.

Referring to FIG. 4, the sealing ring 40 is formed of synthetic rubber or

elastomeric material such as neoprene. The sealing ring 40 comprises flared front and rear ends 41, 42, a narrow intermediate section 43, and an internal bore 44 in which the rear end 42 is fitted in an annular gap formed between the slope 34 and the inner wall of the cylindrical portion 31 prior to coupling the  
5 connector 20 to the cable 50.

Referring to FIGS. 5B in conjunction with FIG. 5A, the coupling operation of the connector 20 and the cable 50 will now be described in detail below. First, insert the front end of the cable 50 into the cylindrical coupling 30 with the outer insulator 52 snugly fitted in the inner sleeve 23 and the central conductor 51  
10 further inserted into a conductive sleeve of a mated connector of an electrical device (not shown) for electrical connection. Also, the outer conductor 53 and the shield 54 are disposed inside the outer sleeve 22. Next, use a tool or the hand to push the cylindrical coupling 30 toward the forward side to compress the sealing ring 40. As a result, the front end 41 is urged against the rear end 29  
15 of the outer sleeve 22 and the intermediate section 43 is further recessed to fasten at the outer surface of the shield 54. This has the advantage of preventing moisture from entering into the connector 20 through the intermediate section 43 and thus preventing the central and the outer conductors 51 and 53 from being rusted by moisture.

20 While the invention herein disclosed has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the invention set forth in the claims.